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ABSTRACT

The major purpose of this inquiry was to examine the impact of Chapter 1 services upon student achievement in reading and mathematics in the Philadelphia (Pennsylvania) School District during the 1987-88 school year. The program affects 162 schools and more than 50,000 children by providing services to those having the lowest academic achievement in schools with the greatest concentration of students from low-income families. The 1986-87 evaluation suggested that there were differences in achievement that should be considered preliminary unless replicated during 1987-88. Data sources for the 1987-88 study included the Pupil Directory Information System, City-Wide Testing Program, Data Confirmation Lists, and High School Roster File. Prior to 1986, the Chapter 1 evaluation analysis indicated that there were no important differences across project types as far as student achievement was concerned. Data from the 1986-87 evaluation indicated that there were differences across project types. The 1987-88 results do not replicate the 1986-87 findings for: benchmark (reading and mathematics); elementary mathematics resource teachers; and Option 4 mathematics. The findings for Option 4 reading and Junior/Middle school mathematics projects were note replicated. Data are presented via five tables and four graphs. (TJH)

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CHAPTER I

READING AND MATHEMATICS ACHIEVEMENT

1987 - 1988

AUGUST 1988

Report No. 8902

OFFICE OF RESEARCH AND EVALUATION

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DESIGN OF THE INQUIRY

The major purpose of this inquiry was to examine the impact of Chapter 1 services upon pupil achievement in reading and mathematics during the 1987-1988 school year.

- The Chapter 1 Program affects 162 schools and more than 50,000 children by providing services to those having the lowest academic achievement in schools with the greatest concentration of pupils from low-income families. As a 50 million dollar supplemental grant, Chapter 1 has the potential for enormous impact.

- Local evaluations have shown that approximately half of the participants in most projects improve performance on standardized tests annually.

- The 1986-1987 evaluation suggested that there were differences in achievement which should be considered to be preliminary unless they were replicated during 1987-1988.

The tasks for this inquiry were:

- To provide descriptive data concerning 1987-1988 pupil participation in the Chapter 1 Program.

- To determine if participation in Chapter 1 projects is linked with achievement in reading and mathematics as measured by standardized tests.

- To determine whether the 1986-1987 results were replicated in the 1987-1988 evaluation.

This report is organized in three major sections:

- The Chapter 1 Evalution and Reporting System (CHIERS)

- Student achievement in reading and mathematics.

- Conclusions.

SECTION 1: CHIERS

This section focuses on the Chapter 1 Evaluation and Reporting System (CHIERS); its sources of information and descriptive data.

Questions:

1. What is the Chapter 1 Evaluation and Reporting System?

2. What are the sources of information contained on CHIERS?

3. How mobile is the Chapter 1 student population in comparison to the School District as a whole?

4. How many pupils were reported as being served by projects that are part of CHIERS during 1987-1988?

5. How many individual students were reported served by reading or mathematics projects?

Data Sources:

Pupil Directory Information System

City-wide Testing Program

Data Confirmation Lists

High School Roster File

1. What is the Chapter 1 Evaluation and Reporting System?

The Chapter 1 Evaluation and Reporting System (CHIERS):

- is an annually updated system for gathering and reporting pupil information regarding the ECIA Chapter 1 program.
- includes information concerning school location, achievement test scores, and Chapter 1 services received.
- helps the District to comply with legal requirements and provides information for project improvement.

2. What are the sources of information included in CHIERS?

Sources of information for CHIERS:

- School location information collected through the Pupil Directory Information File keeps track of pupils as they move from school to school.

- Test scores were obtained from the City-Wide Testing Program computer files, spring 1987 and 1988.

- Project participation information is obtained in two ways:

  The School District's high school roster file lists students in Chapter 1 rostered classes.

  Project staff, in each school not part of the District's roster file, indicate on Data Confirmation Lists which students are served.

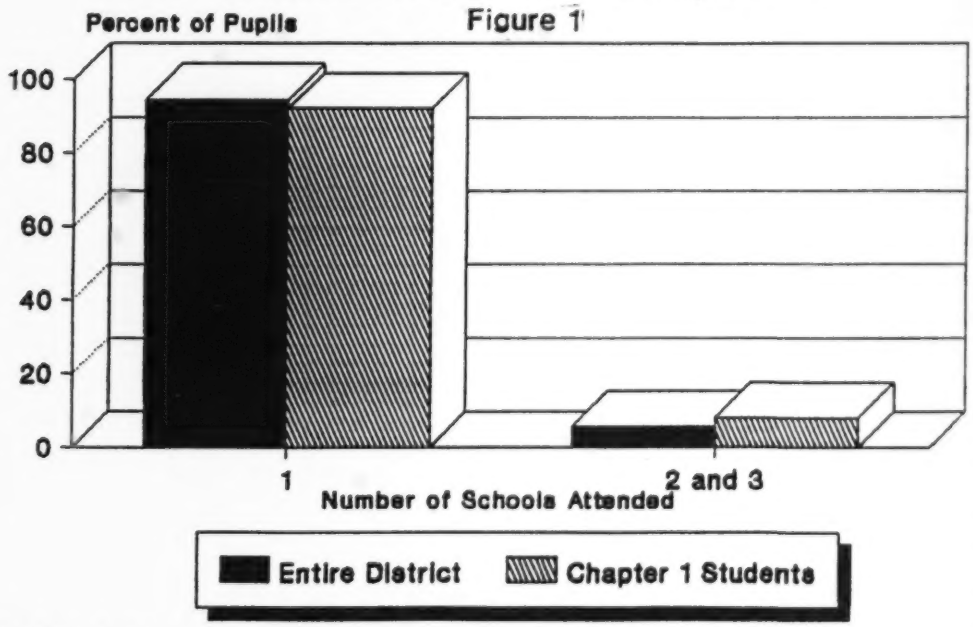
3. How mobile is the Chapter 1 student population in comparison to the School District as a whole?

- Mobility has often been cited as a reason for poor performance.
- A stability index was calculated by determining the proportion of pupils who did not change schools during the year.
- The students who received Chapter 1 services were nearly as stable as the larger school district population.
- Most children served by Chapter 1 are likely to receive consistent services across the school year.

Pupil Stability 1987 - 1988*

Districtwide vs. Chapter 1

Figure 1



Stability Index = the proportion who do not change schools.

4. How many pupils were served in each of the Chapter 1 projects during 1987-1988?

TABLE 1

PUPILS SERVED IN 1987-1988

Project	Count	Area
1. District Reading	37,247	Reading
2. ESOL Option 4	2,430	Reading
3. ESOL (Other)	418	Reading
4. Option 4 Reading	3,966	Reading
5. Option 4 Mathematics	5,716	Mathematics
6. Schoolwide Projects	6,133	Both
7. Satellite C (Skills Center)	614	Reading
8. Benchmark	802	Both
9. Project Success - Bilingual Options	278	Both
10. Project Success - Best Elements	4,108	Both
11. EWA	617	Reading
12. EMRT	6,936	Mathematics
13. Jr./Middle Mathematics	1,198	Mathematics
14. Mathematics Specialists	48	Mathematics
15. Mathematics Skill Centers	171	Mathematics
16. Mission: Excellence Reading	1,238	Reading
17. Mission: Excellence Mathematics	840	Mathematics
18. School Community Coordinator	49,938	N/A
19. Satellite A (Botel)	164	Reading
20. Satellite B (HILS)	346	Reading
21. Satellite D (Prescription Labs)	960	Reading
22. Prescription Labs - Mathematics	299	Mathematics
Total Chapter 1 Services (duplicate count)	124,467	

5. How many individual students were reported served by reading or mathematics projects?

- Nearly 59,000 individuals were served in reading or mathematics projects.

Individual Chapter 1 Services in Reading and Mathematics 1987-1988

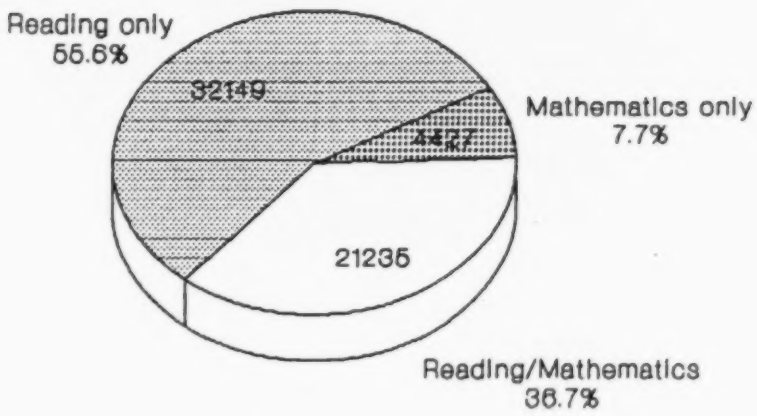


Figure 2

Source: CHIERS 1987-88 unduplicated service counts.

SECTION 2: STUDENT ACHIEVEMENT

This section focuses on the how achievement is measured; the results of reading and mathematics achievement on standardized test are detailed.

Questions:

6. How is student achievement measured?

7. What cautions should be exercised when interpreting achievement information?

8. What were the pretest scores and grade levels of those who were included in the achievement analyses?

9. What were the achievement results for Chapter 1 reading projects.

10. Were there exceptions to the findings for reading achievement?

12. What were the achievement results for Chapter 1 mathematics projects?

11. Were there exceptions to the findings for mathematics achievement?

Data Sources:

Pupil Directory Information System

City-wide Testing Program

Data Confirmation Lists

High School Roster File

6. How is student achievement measured?

- When Chapter 1 evaluation systems were first proposed by the federal government, an evaluation model was prescribed as well. This model assumes that, in the absence of an educational intervention beyond the regular school program, children will maintain their Normal Curve Equivalent scores (NCE's are normalized National Percentile Ranks) from year to year.

- The evidence of a Chapter 1 effect above and beyond the effect of the regular school program is, by definition, a pretest to posttest improvement in the NCE.

- There are two achievement criteria which are reported on a grade by grade basis, and for the Chapter 1 served group as a whole:

  Percentage of Success - The percentage of students who increased their NCEs from pretest to posttest.

  Mean NCE Gain - The pretest to posttest improvement in the NCE of the average score for each group.

COMMENT

In summary, this model seeks to document an effect which is over and above what one would expect based on historical performance. While this might be true under ideal conditions, the reality of field evaluation prevents attributing the results to Chapter 1 alone (i.e., causal effect). Thus, overall School District improvement and/or its interaction with supplementary programs may also serve to explain achievement.

7. What cautions should be exercised when interpreting achievement information?

- Comparisons between projects which serve dissimilar groups are misleading.
- The grade levels of the students being served and their initial achievement levels must be taken into consideration when examining achievement.
- Totals are not presented because the variation in the grades served by the projects is too great.

8. What were the pretest scores and grade levels of those who were included in the achievement analyses?

- Table 2 shows pretest scores, grade levels and number of students in the analyses for each project.
- Students were included in the achievement analyses if they: received service for at least four months, had both pretest and posttest scores.
- There were differences in the initial achievement levels among those served in various reading projects.

TABLE 2

MEAN PRETEST SCORES, GRADE LEVELS, AND NUMBER OF STUDENTS IN THE ANALYSIS

Project	Grade Range	Reading Data Number	Reading Data NCE	Mathematics Data Number	Mathematics Data NCE
Comp. Reading	1-12	28,315	37.35		
ESOL OPTION 4	1-10	1,165	22.22		
Other ESOL	1-3	203			
Option 4	1-11	3,075	34.30	3,458	35.15
Schoolwide Projects	1-8	3,960	39.24	3,924	47.55
Benchmark	4-6	714	31.95	707	31.79
Bilingual Options	1-3	196	24.35	180	27.20
Best Elements	1-4	3,063	29.89	3,050	34.77
EMRT	1-8			5,808	31.50
Junior/Middle	6-9			723	36.78
High School Math Specialists	9-11			*	*
Mission: Excellence	7-12	515	29.59	257	36.97
Model A: Botel Milestone	4-6	118	34.16		
Model B: High Intensity	4-6	280	37.20		
Model C: Reading Skill Center	3-6	521	32.90		
Model D: Prescription Learning	3-9	802	33.92	74	37.20

*Insufficient data to conduct analysis

9. What were the achievement results for Chapter 1 reading projects?

- Tables 3a and 3b contain the detailed, grade by grade information for the Chapter 1 reading projects.
- The percentages and NCE gains vary considerably from grade to grade.
- There were only slight differences in the mean NCE gains.
- Lowest levels of performance occured in grades 7-12.

Table 3a

A Comparison of Reading Projects' Achievement in Grades 1 - 6

Project	Criterion	Grade 1	2	3	4	5	6
ESOL OPTION 4	% Greater	56.49	40.36	49.62	66.35	64.00	33.33
OTHER ESOL SERVICE	% Greater	29.50	40.67	45.83			
PROJECT SUCCESS: BILINGUAL OPTIONS	% Greater	66.32	35.71	53.57			
DISTRICT READING PROJECT	% Greater	56.72	39.81	60.14	54.54	54.32	43.09
OPTION 4	% Greater	44.44	44.40	58.63	63.57	53.96	41.85
SCHOOLWIDE PROJECTS	% Greater	53.26	33.83	56.93	43.35	56.15	42.98
PROJECT SUCCESS: BEST ELEMENTS	% Greater	63.12	43.42	59.12	67.10		
SATELLITE CENTER A	% Greater				75.55	60.88	46.42
SATELLITE CENTER B	% Greater				64.04	70.76	46.82
SATELLITE CENTER C	% Greater			62.19	59.62	66.66	33.62
SATELLITE CENTER D	% Greater			65.73	72.72	69.23	49.58
BENCHMARK	% Greater				80.95	65.97	47.84
ALL READING PROJECTS COMBINED	% Greater	56.95	39.92	59.56	55.33	55.48	43.04
ESOL OPTION 4	Change in NCE	3.71	-0.11	3.85	5.99	1.92	-6.68
OTHER ESOL SERVICE	Change in NCE	-8.20	1.19	-0.08			
PROJECT SUCCESS: BILINGUAL OPTIONS	Change in NCE	10.17	-2.29	1.28			
DISTRICT READING PROJECT	Change in NCE	3.70	-3.76	5.54	1.29	1.25	-1.38
OPTION 4	Change in NCE	-2.05	-1.25	4.69	4.40	0.15	-0.69
SCHOOLWIDE PROJECTS	Change in NCE	2.54	-7.27	4.37	-2.36	1.65	-1.66
PROJECT SUCCESS: BEST ELEMENTS	Change in NCE	6.82	-0.39	5.06	6.82		
SATELLITE CENTER A	Change in NCE				5.94	3.71	-3.58
SATELLITE CENTER B	Change in NCE				5.67	3.14	0.04
SATELLITE CENTER C	Change in NCE			4.93	5.00	4.11	-3.01
SATELLITE CENTER D	Change in NCE			6.91	5.91	5.28	0.20
BENCHMARK	Change in NCE				8.58	5.08	0.15
ALL READING PROJECTS COMBINED	Change in NCE	3.91	-3.56	5.34	1.66	1.42	-1.35

N.B., ESOL Option4, Other Esol Service, and Project Success: Bilingual Options are not included in the analysis of project effects because they serve a specialized population.

Table 3b

A Comparison of Reading Projects' Achievement in Grades 7 - 12

Project	Criterion	Grade 7	8	9	10	11	12
ESOL OPTION 4	% Greater	61.90	34.88	14.28	28.07		
SCHOOLWIDE PROJECTS	% Greater	65.38	62.50				
SATELLITE CENTER D	% Greater	56.25	59.57	43.75			
DISTRICT READING PROJECT	% Greater	57.41	52.40	48.30	52.04	46.11	34.05
OPTION 4	% Greater	60.86	47.74	50.80	41.79	33.66	
MISSION: EXCELLENCE	% Greater	54.16	49.01	51.42	42.98	37.14	34.09
ALL READING PROJECTS COMBINED	% Greater	57.55	52.22	46.19	45.34	41.44	35.23
ESOL OPTION 4	Change in NCE	5.54	-1.93	-8.31	-2.42		
SCHOOLWIDE PROJECTS	Change in NCE	4.66	3.97				
SATELLITE CENTER D	Change in NCE	3.13	2.78	-0.44			
DISTRICT READING PROJECT	Change in NCE	2.71	1.42	0.50	1.28	-0.15	-4.79
OPTION 4	Change in NCE	1.94	-1.46	-0.26	-1.56	-3.96	
MISSION: EXCELLENCE	Change in NCE	1.02	0.47	1.08	0.69	-4.70	-4.60
ALL READING PROJECTS COMBINED	Change in NCE	2.69	1.32	-0.22	0.16	-1.89	-4.59

10. Were there exceptions to the findings for reading achievement?

Projects with results noticiably above the average:

- Project Success: Best Elements (except grade 3)
- Satellite Centers A
- Satellite Center B
- Satellite Centers D (grades 3-6)
- Benchmark (grades 4-6)
- Schoolwide Projects (grades 7-8)*

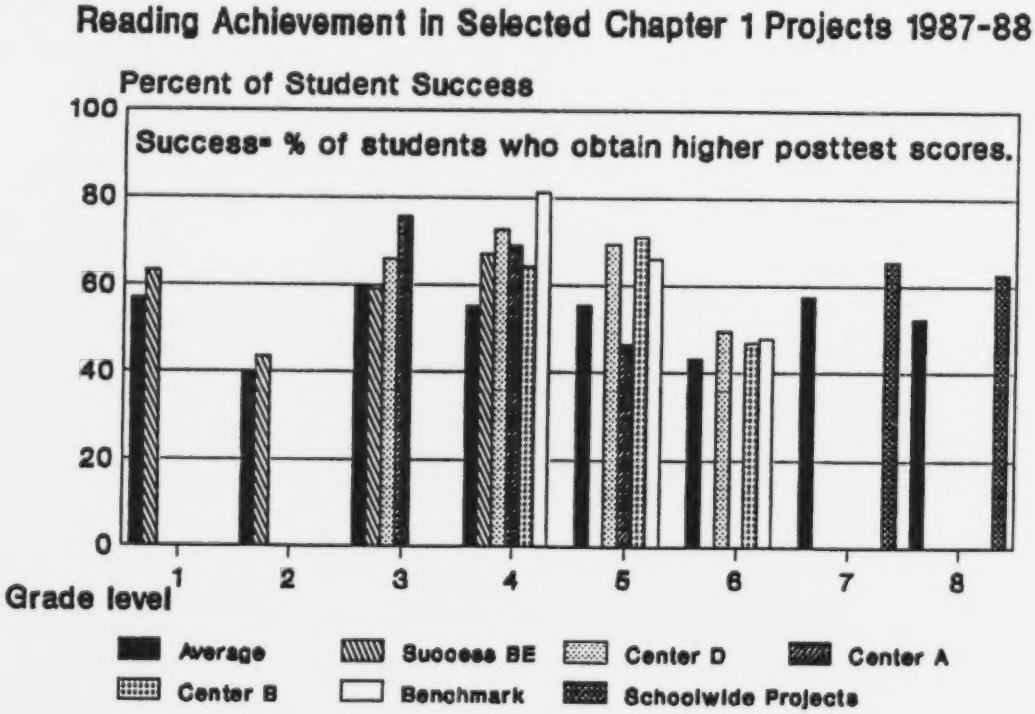


Figure 3

*Note: This Schoolwide project finding is restricted to only one site which provides services to grade 7 and 8.

11. What were the achievement results for Chapter 1 mathematics project?

- Tables 4a and 4b contain the detailed, grade by grade information for the Chapter 1 mathematics projects.
- The percentages and NCE gains vary considerably from grade to grade.
- Lowest levels of performance occured in grades 7-9.

Table 4a

A Comparison of Mathematics Projects' Achievement in Grades 1 - 6

Project	Criterion	Grade 1	2	3	4	5	6
PROJECT SUCCESS: BILINGUAL OPTIONS	% Greater	80.41	52.63	57.69			
PROJECT SUCCESS: BEST ELEMENTS	% Greater	71.87	61.09	53.97	60.65		
SCHOOLWIDE PROJECTS	% Greater	54.25	48.53	40.25	44.75	52.47	64.64
OPTION 4 MATHEMATICS	% Greater	100.00	60.25	60.37	66.84	61.71	76.26
EMRT	% Greater	74.68	69.45	67.73	63.12	64.10	77.60
JUNIOR/MIDDLE MATHEMATICS	% Greater						74.07
BENCHMARK	% Greater				69.17	69.06	81.14
PRESCRIPTION LABS	% Greater						
ALL MATHEMATICS SERVICES	% Greater	65.84	58.82	56.59	59.22	61.87	74.38
PROJECT SUCCESS: BILINGUAL OPTIONS	Change in NCE	22.94	3.32	1.97			
PROJECT SUCCESS: BEST ELEMENTS	Change in NCE	15.54	8.82	1.28	6.71		
SCHOOLWIDE PROJECTS	Change in NCE	5.20	-0.37	-5.23	-1.55	-0.88	8.53
OPTION 4 MATHEMATICS	Change in NCE	50.63	12.40	4.81	10.68	7.83	17.40
EMRT	Change in NCE	17.56	13.05	8.23	8.76	8.14	16.90
JUNIOR/MIDDLE MATHEMATICS	Change in NCE						10.60
BENCHMARK	Change in NCE				15.77	12.59	20.80
PRESCRIPTION LABS	Change in NCE						
ALL MATHEMATICS SERVICES	Change in NCE	12.38	6.68	2.73	6.76	6.80	15.21

Table 4b

A Comparison of Mathematics Projects' Achievement in Grades 7 - 11

Project	Criterion	Grade 7	8	9	10	11	12
SCHOOLWIDE PROJECTS	% Greater	55.76	23.8				
EMRT	% Greater	63.15	50.00				
JUNIOR/MIDDLE MATHEMATICS	% Greater	50.14	43.25	35.36			
10TH GRADE SPECIALIST	% Greater						
OPTION 4 MATHEMATICS	% Greater	50.75	46.83	40.05	59.37	60.42	
MISSION: EXCELLENCE	% Greater	39.28	47.61	44.56	74.13	62.50	
ALL MATHEMATICS SERVICES	% Greater	51.60	45.00	40.49	62.03	66.66	
SCHOOLWIDE PROJECTS	Change in NCE	3.48	-5.90				
EMRT	Change in NCE	4.33	1.69				
JUNIOR/MIDDLE MATHEMATICS	Change in NCE	1.47	-1.41	-0.39			
10TH GRADE SPECIALIST	Change in NCE						
OPTION 4 MATHEMATICS	Change in NCE	-0.34	-1.73	-1.87	4.55	4.53	
MISSION: EXCELLENCE	Change in NCE	-4.90	-2.00	-1.53	8.32	2.06	
ALL MATHEMATICS SERVICES	Change in NCE	0.62	-1.51	-1.54	5.21	3.79	

12. Were there exceptions to the findings for mathematics achievement?

Projects with results noticeably above the average:

- Elementary Mathematics Resource Teachers
- Option 4 (elementary level; except grade 5)
- Project Success: Best Elements (except grade 3)
- Benchmark

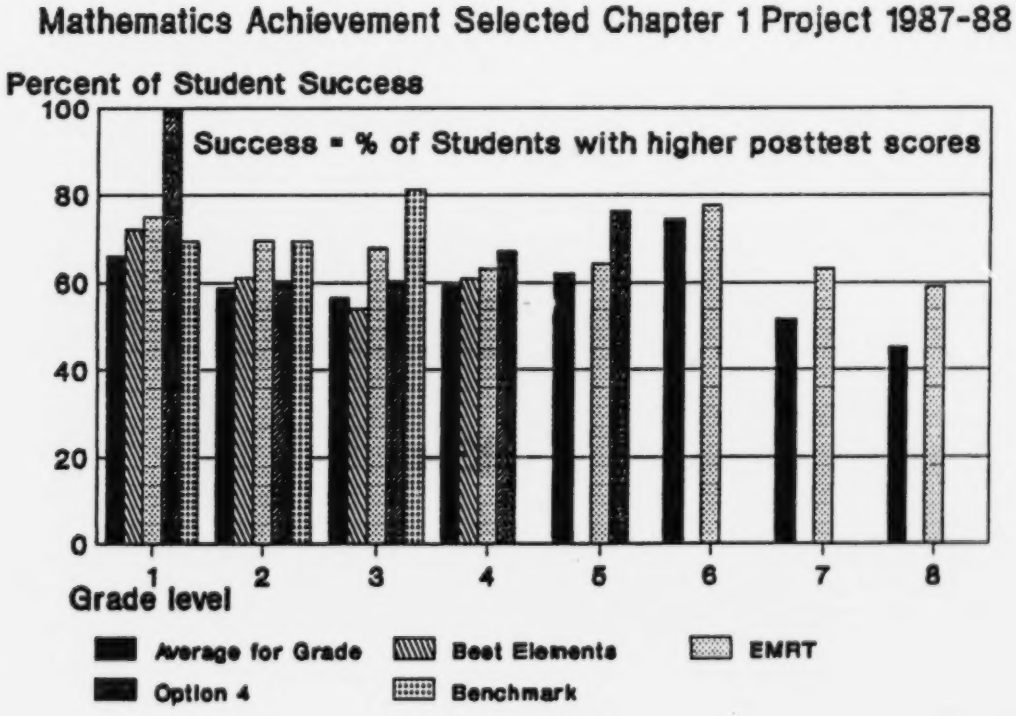


Figure 4

SECTION 3: CONCLUSIONS

This section draws conclusions concerning project findings and determines the degree to which the 1986-1987 findings were replicated.

Questions:

13. Which Chapter 1 reading and mathematics projects tend to be more effective?

14. Were the 1986-1987 CHIERS finding replicated during 1987-1988?

Data Sources:

Pupil Directory Information System

City-wide Testing Program

Data Confirmation Lists

High School Roster File

Report No. 8831: CHIERS 1987 Update

13. Which Chapter 1 reading and mathematics projects tend to be more effective?

Examination of the projects' relative performance on a grade by grade basis indicated:

- Projects that provide more intensive services tend to be more effective than those that provide less concentrated services.

- Projects with pupil: adult ratios of 20 or less tended to achieve better results than the average.

14. Were the 1986-1987 CHIERS finding replicated during 1987-1988?

- Prior to 1986, CHIER analyses detected no important differences among projects.
- The discovery that some projects were more effective than others was first reported in 1986-1987.
- The 1986-1987 findings have been replicated for:
  Benchmark (Reading and Mathematics)
  Elementary Mathematics Resource Teachers
  Option 4 mathematics
- The findings for Option 4 Reading and Jr/Middle School Mathematics projects were not replicated at this time.

TABLE 5

REPLICATION OF 1986-1987 CHIERS FINDINGS

Service	Projects	Number of Comparisons	Superiority to Average 1986-87	Superiority to Average 1987-88	Findings Replicated
Reading	Benchmark	6	6	6	Yes
	*Option 4	12	11	5	No
Mathematics	Benchmark	6	4	6	Yes
	EMRT	16	16	16	Yes
	Jr/Middle	8	5	3	No
	*Option 4	12	11	11	Yes

Comparisons were made for each grade served on each criteria: (1) Size of average NCE gain (2) Percent of students with Positive NCE gains.

*Elementary grades 1-6 only.